



COMDTINST 6260.25

MARCH 2 1993

## COMMANDANT INSTRUCTION 6260.25

Subj: Implementation of the Benzene Occupational Exposure Standard

Ref: (a) 29 CFR 1910.1028, Benzene Standard

- (b) COMDTINST 6260.21A, Hazard Communication for Workplace Materials
- (c) COMDTINST M6260.2 (series), Technical Guide: Practices for Respiratory Protection
- (d) COMDTINST M6000.1 (series), Medical Manual
- (e) COMDTINST M16000.6 (series), Marine Safety Manual,

### Volume I, Appendix G

1. PURPOSE. This instruction promulgates the requirements of reference (a) concerning occupational exposure to benzene.
2. DIRECTIVES AFFECTED. COMDTINST 6260.22, Implementation of the Benzene Exposure Standard, is canceled.
3. BACKGROUND. Benzene has been identified as a human carcinogen. Occupational exposure to benzene has been associated with the development of leukemia, a cancer of the body's blood forming system. Chronic exposure to even a low concentration has been correlated with other adverse changes such as aplastic anemia. Aplastic anemia is a disease that reduces the ability of the bone marrow to produce sufficient red blood cells to adequately oxygenate the body's tissues. Inhalation of benzene vapors is the primary route of exposure, although absorption through intact skin is also possible.

4. DISCUSSION.

- a. The OSHA permissible Exposure Limit (PEL) is 1.0 part per million (ppm) and the Short Term Exposure Limit (STEL) is 5.0 ppm. Consistent with these standards, the Coast Guard's maximum 8-hour Time Weighted Average (TWA) will remain at 1.0 ppm. Likewise, the 15-minute STEL of 5.0 ppm will be maintained. All personnel are encouraged, however, to keep occupational exposure to benzene as low as practicable.
- b. Benzene can be used as a solvent for paints, oils, inks, and rubber cement. It may also be found as a component of some petroleum products such as unleaded gasoline and jet fuels. Requirements contained herein do not apply to mixtures where the benzene content is less than 0.1% by volume.

5. GENERAL REQUIREMENTS.

- a. Industrial Hygiene Risk Assessment Program.
  - (1) Benzene Identification. The Material Safety Data Sheets (MSDS) required for all hazardous materials found at each Coast Guard unit in accordance with reference (b) will indicate whether benzene is present in these products. Whenever possible, the MSDS should be the data sheet provided by the product manufacturer. During the course of their duties, marine safety personnel encounter various petroleum and chemical products which may contain significant amounts of benzene. These products have been identified and are listed in enclosure (2). This list should not be considered as all inclusive.
  - (2) Exposure Monitoring. Initial exposure monitoring is required for every workplace where benzene is identified. Job-specific exposure monitoring guidelines are contained in paragraph 5.c. Monitoring must be repeated on a semiannual basis if the initial concentration is greater than 1.0 ppm as an 8-hour TWA. In the case where the initial concentration is less than 1.0 ppm, but greater than the action level of 0.5 ppm, annual exposure monitoring is required. Only breathing zone samples will meet the exposure monitoring requirements (use of colorimetric tubes by certified marine chemists to meet confined space entry requirements is not affected by this instruction). Sampling should be done by or under the supervision of a Coast Guard or contract industrial hygienist. Analysis of bulk and air samples shall be conducted only by American Industrial Hygiene Association (AIHA) certified laboratories.

5. a. (2) (cont'd) Monitored employees must be notified of sample results in writing within 15 days after receipt of analytical results.
  - b. Risk Management. The following risk management strategies shall be implemented whenever benzene exposures to Coast Guard personnel exceed the Coast Guard exposure standard of 1.0 ppm:
    - (1) Avoid or reduce any benzene exposure by:
      - (a) changing work practices (new work procedures must be validated by exposure monitoring if there is any possibility of continued exposure to benzene).
      - (b) substituting products which do not contain benzene.
    - (2) When benzene exposure cannot be avoided and where feasible, utilize engineering controls (e.g., exhaust ventilation) to reduce the exposure to as low a level as possible.
    - (3) Respiratory protection is required whenever exposures cannot be reduced below 1.0 ppm. For concentrations up to 10.0 ppm, use of an air purifying respirator with organic vapor cartridges is permitted. Use of respirators requires implementation of a comprehensive respiratory protection program in accordance with reference (c). Emergency entry into atmospheres containing greater than 10 ppm of benzene requires the use of an SCBA or airline respirator.
    - (4) Utilize protective clothing to protect eyes and skin whenever a splash hazard exists.
  - c. Occupational Medical Monitoring Program (OMMP).

Personnel exposed to benzene concentrations equal to or greater than 0.5 ppm as an 8-hour TWA for 30 or more days per year shall be included in the OMMP as specified in reference (d). Exposures must be validated by an industrial hygienist prior to enrollment in the OMMP. The point of contact for medical monitoring support is the appropriate MLC (k).
6. JOB-SPECIFIC REQUIREMENTS.
    - a. A number of operations and activities which have the potential for exposure to benzene from aviation jet fuels have been identified and risk assessments conducted. Risk management requirements are outlined in enclosure (1).

- b. Marine safety activities involving the products listed in enclosure (2) represent a second category of potential exposure to benzene vapors. The available industrial hygiene exposure data indicates that benzene concentrations can be significant when conducting certain activities such as cargo transfer monitoring, tank vessel internal inspections, and pumproom entry. The risk management strategies described in reference (e) shall be employed to protect Coast Guard personnel conducting these and other marine safety activities where benzene exposure is possible.
    - c. Additionally, pollution response activities for those products listed in enclosure (2) present a benzene exposure hazard to Coast Guard personnel. Prior to conducting post-emergency pollution response activities for these substances, a site characterization should be conducted by a qualified person to determine the airborne concentration of benzene. For minor spills and spills of products with a low/moderate benzene content, a properly trained person (MESPOC, PODC, SOHC, etc.) or a competent person as defined in COMDTINST M5100.48, Confined Space Entry Manual, may perform initial site characterization (i.e., indicator tube monitoring).
    - d. In the event of an acute overexposure to benzene vapors, medical advice can be obtained through the Agency for Toxic Substances and Diseases Registry (ATSDR) 24 hours a day by calling 404-639-0615. For the purposes of this instruction, an acute overexposure can be defined as any measured exposure exceeding the Short Term Exposure Limit (STEL) of 5.0 ppm or whenever the exposed person is exhibiting symptoms of benzene overexposure (headache, nausea, dizziness, drowsiness).
7. SOURCES OF TECHNICAL ASSISTANCE. Industrial hygiene support to conduct air sampling or risk strategy assessment is available from the respective MLC (k) or the appropriate district safety and occupational health specialist.
8. RESPONSIBILITIES.
  - a. District industrial hygienists, via the district commander, shall assist district units in conducting risk assessment and management, and provide other assistance as requested.
  - b. Commander, Maintenance and Logistics Commands (k) shall:
    - (1) Assist units as requested in conducting risk assessment and management.

8. b. (2) During the annual unit safety and environmental health audit:
    - (a) Identify those operations or activities in which a potential for benzene exposure exists;
    - (b) Ensure that the appropriate personnel are enrolled in the OMMP; and
    - (c) Provide other assistance to units as requested.
  - c. Unit commanding officers and officers-in-charge shall identify operations and activities having the potential for exposure to benzene and ensure that the risk assessment and management requirements of this instruction are implemented.
9. ACTION. Area and district commanders, commanders of maintenance and logistics commands, Commander, Coast Guard Activities Europe, and unit commanding officers shall ensure compliance with the provisions of this instruction.

/s/ MICHAEL HUDGINS  
Chief, Office of Health and Safety

Encl: (1) Risk Management Requirements for Jet Fuel Handling Activities  
(2) List of Benzene-Containing Products

LIST OF BENZENE-CONTAINING PRODUCTS

1. HIGH BENZENE CONTENT (TYPICALLY 10% OR GREATER)

BENZENE (BNZ)  
BENZENE HYDROCARBON MIXTURES CONTAINING 10% OR MORE  
BENZENE (BHB)  
BENZENE, TOLUENE, XYLENE MIXTURES (BTX)  
C-5 MIXTURE (15% OR MORE BENZENE, ISOPRENE, 1,3-PENTADIENE) (CFX)  
GASOLINE BLENDING STOCK REFORMATES (GRF)  
WHITE SPIRIT (WSP)  
WHITE SPIRIT (LOW (15-20%) AROMATIC) (WSL)

TRADE NAMES

(The following product should be considered to contain high amounts of benzene until product documentation--such as material safety data sheets (MSDSs)--document otherwise.):

"dripolene"

2. MODERATE BENZENE CONTENT (TYPICALLY 1% OR GREATER)

BENZENE HYDROCARBON MIXTURES WITH ACETYLENE (BHA)  
CYCLOPENTADIENE, STYRENE, BENZENE MIXTURES (CSB)  
GAS OIL (GOC)  
GASOLINES:  
GASOLINE: AROMATIC (GAR)  
GASOLINE: AUTOMOTIVE (GAT)  
GASOLINE: AVIATOR (GAV)  
GASOLINE: PYROLYSIS (greater than 5% benzene) (GPY)  
GASOLINE: STRAIGHT RUN (GSR)  
JET FUEL: JP-4 (JPF)  
NAPHTHA  
NAPHTHA: SOLVENT (NSV)  
NAPHTHA: STODDARD SOLVENT (NSS)  
NAPHTHA: VM&P (75% NAPHTHA) (NVM)  
PETROLEUM NAPHTHA (PTN)

TRADE NAMES:

(The following products should be considered to contain moderate amounts of benzene until product documentation--such as material safety data sheets (MSDSs)--document otherwise.):

"butadiene, benzene mix"

"coal tar light oil"

"coke oven light oil"

"commercial JET-B"

"crude styrene"

"ethylene dichloride--crude"

"depentanized aromatic stream"

"hytrol D"

2. MODERATE BENZENE CONTENT (TYPICALLY 1% OR GREATER) (cont'd)

"light aromatics containing benzene"  
"naphtha cracking fraction"  
"petroleum hydrocarbon polymers"  
"phenol (and cresol mixtures with 5% benzene or more)"  
"rubber solvent"  
"Varsol 1, 3, and 18"

3. LOW BENZENE CONTENT (TYPICALLY 1% OR LESS)

COAL TAR:

COAL TAR (COR)  
COAL TAR PITCH (CTP)  
COAL TAR NAPHTHA (NCT)  
COAL TAR OIL see oil: coal tar (OCT)

OILS:

OIL: CRUDE OIL (OIL)  
OIL: COAL TAR (OCT)

4. FORMERLY LISTED (formerly listed but no longer considered to typically contain more than 0.1% benzene by volume): JET FUEL: JP-5 (JPV) or "Commercial JET-A"

RISK MANAGEMENT REQUIREMENTS  
FOR SOME JET FUEL HANDLING ACTIVITIES

1. Aircraft Refueling. Pressurized refueling poses minimal risk of benzene exposure. Gravity refueling of aircraft with fuel vents near the fill tube presents the greatest exposure potential to the refueler. This is due to the release of benzene vapors through the vent as the fuel tank fills. Sampling data confirms that benzene vapors are released at a greater rate during gravity refueling, but the exposures do not exceed 1.0 ppm. Accordingly, respirator use is not required during normal refueling operations.
2. Maintenance of Aircraft Fuel Dispensing Pump Systems. High benzene exposures have been recorded during pump disassembly and filter replacement. These systems may be part of the fueling facility and/or the fuel truck. Personnel shall utilize a full face air purifying respirator equipped with organic vapor cartridges or a full face powered air purifying respirator equipped with organic vapor cartridges when performing these activities. Additionally, the use of protective clothing and gloves is required to avoid benzene absorption through intact skin.
3. Fuel Tank/Cell Entry. Exposures to benzene and other volatile jet fuel components as well as sealants used for repair are likely during tank/cell entry. High benzene concentrations have been documented even following normal tank ventilation. Confined space entry procedures as found in Air Force Technical Order T.O. 1-1-3, Sections I, III, and IV must be strictly adhered to in order to manage risks from inhalation and/or absorption of toxic materials, oxygen deficiency, flammability, and explosive hazards. Confined space testing should be done by a Bio-Environmental Engineer (Air Force BEE), an industrial hygienist, or certified marine chemist. If these resources are unavailable, a member of the command shall be qualified to perform these duties provided he/she has satisfactorily completed an appropriate training course such as those described below.

<u>Course Title (#)</u>	<u>Fee</u>	<u>Location</u>
Gas-Free Engineering for Non-Maritime Operations (OSH 245E)	no cost	Navy Safety School 9080 Breezy Point Crescent Norfolk, VA 23511-3998 Tel: 804-445-8778
ConfinedSpace Entry (OSH 226)	no cost	OSHA Training Institute Des Plaines, IL



<u>Course Title (#)</u>	<u>Fee</u>	<u>Location</u>
Introduction to the Competent Person Program (OSH 520)	no cost	OSHA Training Institute Des Plaines, IL
Competent Person Training	\$150	National Fire Protection Association Tel: 617-770-3000

4. Other Operations. Sampling data for indoor (non-hangar) operations indicates that benzene concentrations may quickly build-up in poorly ventilated areas. Helicopter fuel cells must be thoroughly purged prior to removal. If this is not possible, use of an air purifying respirator with organic vapor cartridges and protective clothing are mandatory when performing the repair work. Fuel analysis should be done in a well-ventilated area or under local exhaust ventilation. Fuel sampling ("clear and bright sampling") does not generate detectable benzene concentrations, and accordingly, respiratory protection is not required.